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Discrete Mathematics 273 (2003) 1–6

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## Foreword

This volume contains selected contributions to the *Euroconference on Combinatorics, Graph Theory and Applications, EuroComb'01*, and one of its satellite Workshops, *Graphs, Morphisms and Applications* which were held in the *Centre de Recerca Matemàtica, CRM* in Barcelona in September 2001 (Figs. 1 and 2).

The topic of EuroComb'01 was Combinatorics and Graph Theory, concentrating mainly on four areas: Algebraic, Algorithmic, Geometric and Probabilistic Combinatorics, including their applications to other areas of Mathematics, Computer Science and Engineering. There were eight invited talks given by Noga Alon (Tel Aviv), Peter Cameron (London), David Eppstein (Irvine), Levon Khachatrian (Bielefeld), Jiří Matoušek (Prague), Kevin Phelps (Auburn), Carsten Thomassen (Lyngby) and Nick Wormald (Melbourne). There were 41 communications running in two parallel sessions and 25 posters, selected among 103 submissions by the Scientific Committee formed by Stefan Felsner (Berlin), Gyula Karolyi (Budapest), Willem H. Haemers (Tilburg), Ferran Hurtado (Barcelona), Michal Karonski (Poznan), Conrado Martínez (Barcelona), Jaroslav Nešetřil (Prague, Chairman), Marc Noy (Barcelona), Andrzej Proskurowski (Eugene), André Raspaud (Bordeaux), Oriol Serra (Barcelona) and Dominic Welsh (Oxford). The extended abstracts of all these contributions were published in the special volume of *Electronic Notes in Discrete Mathematics*, Vol. 10.

The conference was the main event in a series of activities from the special semester in combinatorics held at the Centre de Recerca Matemàtica, CRM. We are grateful to the director of the CRM, Dr. M. Castellet, and the staff, M. Julià and C. Roca, for their valuable and efficient support to the success of the Conference.

EuroComb'01 was supported by the High-Level Scientific Conferences Program of the European Commission in collaboration with the Research Councils of Catalonia (DURSI) and Spain (MCyT), DIMATIA and ITI (Prague), the Universitat Autònoma de Barcelona (UAB) and the Universitat Politècnica de Catalunya (UPC). We are enormously grateful to these supporting institutions, particularly to the European Commission for the support it provided to young researchers.

The conference also hosted the Annual Meeting of DIMATIA, Center for Discrete Mathematics, Computer Science and Applications, which was an independent and full success. DIMATIA has been the energy source from which the idea of this European meeting in combinatorics emerged and will continue to foster subsequent editions, the next one EuroComb'03 to be held in Prague in September 2003.

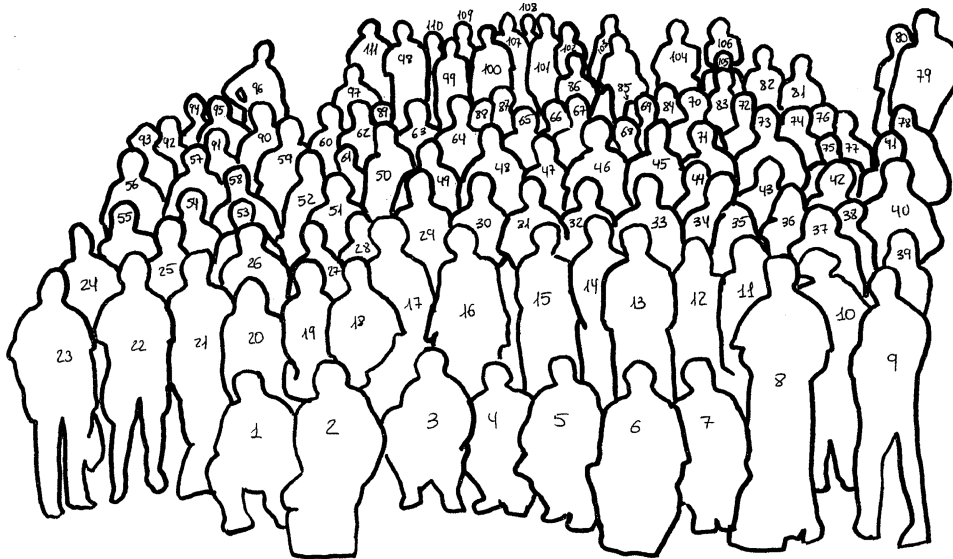
We thank Peter Hammer for providing this special issue of *Discrete Mathematics*, and we thank Nelly Segal and Scott Alessi at the Editorial Office for keeping the project moving along.



Fig. 1. Some of the participants to the Workshop Graph Homomorphism and Applications at the door of the modernist café *Els Quatre Gats* (Barcelona). From left to right, Hanno Lefman, Xuding Zhu, Mohammad Hosseini, Endre Székere, Jorgen Bang-Jensen, Jaroslav Nešetřil, Eric Sopena, Gena Hahn, André Raspaud and Oriol Serra.



Fig. 2. Participants of EuroComb'01.




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1 H. Kheddouci	17 David Eppstein	39 Sonia P. Mansilla	63 Martin Klazar	82 Margarida Mitjana	104 Dimitrios Thilikós
2 V. Ravelomanana	18 Sándor Fekete	40 André Raspaud	64 János Barát	83 Pavel Valtr	105 Joan Gimbert
3 Jaroslav Nešetřil	19 Hazel Everett	41 Petra Smolikova	65 Martin Mares	85 Jiri Matousek	106 Ioannis Michos
4 Oriol Serra	21 G.Y. Katona	44 Maria Teresa Alves	66 Petr Panceroska	85B Cristina Fernández	107 Bernhard Fuchs
5 Eugenio Fedriani	22 Tamás Fleiner	46 Pavol Hell	68 Ian Wanless	86 Oleg Pikhurko	108 Nick Wormald
6 Noga Alon	23 Josep Rifa	47 A. Proskurowski	69 Pangrac Ondrej	87 Jana Maxova	109 Hana Polensenska
7 Kiyoshi Ando	24 Gerard Cohen	48 Sven Hartmann	71 Oda Sans	88 Jiri Fiala	110 Hana Casenska
8 Tibor Jordán	25 Colin McDiarmid	49 Peter Cameron	72 Kris Coolsaet	91 David Orden	
9 Guy Melançon	26 Marco Pellegrini	50 W.H. Haemers	73 Taral Seierstad	92 Christophe Paul	
10 Francesca Merola	27 Javier Ozón	51 Levon Khachatrian	74 Carlos Marijuan	94 Olivier Togni	
11 Sulamita Klein	29 Glenn Hurlbert	53 Jerzy Jaworski	75 Miriam Pisonero	95 Miklos Ruszinko	
12 Anna De Mier	30 Uwe Leck	55 Giulia Galbiati	76 Helena Nyklova	97 Ran Ziv	
13 Pedro García	32 Olivier Bodini	56 Robert Firla	77 Halina Bielak	99 Anne-Elisabeth Baert	
14 Martín Cera	33 Marc Noy	57 Zdenek Ryjacek	78 Robert Babilon	100 Loys Thimonier	
15 Pastora Revuelta	34 Criel Merino	58 Andras Lukacs	79 Jan Kratochvil	102 Selda Kucukcifici	
16 M.J. Chávez de Diego	35 Ares Ribó	60 Guillaume Fertin	80 Tomas Chudlarsky	103 Pascal Weil	

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Fig. 2. *continued.*

A last word is in order to remember our colleague and friend Levon Khachatrian, who sadly passed away shortly after his participation as invited speaker in EuroComb'01. He suddenly disappeared while in the peak of a brilliant career in mathematical research. This volume contains two contributions co-authored by him which represent one of his favourite subjects of research.

Jaroslav Nešetřil  
Marc Noy and Oriol Serra  
*Guest editors*

### Invited speakers, communications and posters at EuroComb'01

#### Invited talks

Noga Alon: Polynomials in combinatorics  
Peter J. Cameron: Random strongly regular graphs?

David Eppstein: Triangles and squares  
 Levon Khachatryan: Extremal problems under dimension constraint  
 Jiří Matoušek: Transversals of hypergraphs with geometric flavor  
 Kevin Phelps: Combinatorial designs and perfect codes  
 Carsten Thomassen: The chromatic number of graphs of fixed girth and genus  
 Nick Wormald: Analysing greedy algorithms on regular graphs

## Communications

- K. Ando, A. Kaneko, K. Kawarabayashi: Vertices of degree 6 in a 6-contraction critical graph  
 A.-E. Baert, V. Ravelomanana, L. Thimonier: On the growth of components with non-fixed excesses  
 H. Bielak: Local and mean ramsey numbers for some graphs  
 O. Bodini: Tiling a Manhattan polyomino with bars  
 J. Borges, J. Rifà, V.A. Zinoviev: On completely regular binary codes and 1-designs  
 V. Bouchitté, F. Mazoit, I. Todinca: Treewidth of planar graphs: connections with duality  
 L. Boza, E.M. Fedriani, A. Marquez, J. Nuez, P. Revuelta: Infinite graph embeddings on tubular surfaces  
 B. Bresar, S. Klavzar, R. Skrekovski: Cubes polynomial and its derivatives  
 J. Burillo, E. Ventura: Counting primitive elements in free groups  
 V. Cepulic: Construction of symmetric block designs using normal subgroups of automorphism groups  
 F. Comellas, M.A. Fiol, J. Gimbert, M. Mitjana: On the spectrum of a weakly distance-regular digraph  
 F. Comellas, J. Ozón: On the universality of small-world graphs  
 B. Doerr: Vector balancing games with aging  
 S. P. Fekete, R.T. Firla, B. Spille: Matching as the intersection of matroids  
 G. Fertin, A. Raspaud: Neighborhood communications in networks  
 P. Frankl, G.Y. Katona: Extremal  $k$ -edge-hamiltonian hypergraphs  
 G. Galbiati: On optimum cycle bases  
 C. Gavoille, C. Paul: Split decomposition and distance labelling: an optimal scheme for distance hereditary graphs  
 M. Hajiaghayi, N. Nishimura, P. Ragde, D.M. Thilikós: Fast approximation schemes for  $K_{3,3}$ -minor-free or  $K_5$ -minor-free graphs  
 S. Hartmann: Orthogonal directed covers by flowers  
 G. Hurlbert: On the pebbling threshold spectrum  
 W. Imrich, J. Zerochnik, B. Zmazek: Weak  $k$ -reconstruction of cartesian product graphs  
 T. Jordan: Non-separable detachments of graphs  
 J. Korner, A. Monti: Delta-systems and qualitative (in)dependence  
 D. Krob, J. Mairesse, I. Michos: On the average Cartier–Foata height of traces  
 U. Leck: On the orthogonal product of simplices and products of truncated Boolean lattices

- M. Loebl, J. Nešetřil, B. Reed: A note on random homomorphism from arbitrary graphs to  $\mathbb{Z}$
- F. Malucelli, S. Nicoloso: Optimal partition of a bipartite graph into non-crossing matchings
- C. McDiarmid, B. Reed: Channel assignment on nearly bipartite and bounded tree-width graphs
- G. Melançon, I. Dutour, M. Bousquet-Melou: Random generation of directed acyclic graphs
- D. Orden, F. Santos: Asymptotically efficient triangulations of the  $d$ -cube
- J. Pfeifle: Kalai's squeezed 3-spheres are polytopal
- K. T. Phelps, M. Villanueva: Bounds on the rank and kernel of perfect codes
- O. Pikhurko: Size Ramsey numbers and integer programming
- M. Ruszinko, Z. Füredi, A. Gyárfas: On the maximum size of  $(p, Q)$ -free families
- M. Stojakovic: On finding the limit shape of optimal convex lattice polygons
- S. Suzuki, T. Ibaraki: Average running time analysis of an algorithm to calculate the size of the union of cartesian products
- J. Telle: Tree-decompositions of small pathwidth
- O. Togni: Optical routing of uniform instances in Cayley graphs
- P. Weil: Graphs, intersections of subgroups of free groups and corank
- D. R. Wood: Geometric thickness in a grid of linear area

## Posters

- C. Balbuena: Using Gumbel distribution to determine the distribution for maximum and minimum in the degree sequence
- J. Bárát: 2-Star-coloring of graphs
- R. Barbosa, D.M. Cardoso: On regular-stable graphs
- L. Boza, M.T. Dávila, E.M. Fedriani, R. Moyano: A Kuratowski theorem for some pseudosurfaces
- P. Cara: Incidence geometries for finite symmetric groups
- A. Carmona: Equilibrium measures on finite networks: effective resistance and hitting time
- M. Cera: Structure of the extremal family  $EX(n; TK^p)$
- M.J. Chávez, M.T. Villar: Triangles  $n$ -connectivity in simplicial 2-complexes
- D. Crnkovic, S. Rukavina: Hadamard  $2-(47, 23, 11)$  designs having  $Frob_{55}$  as an automorphism group
- H. Everett, C. de Figueiredo, S. Klein, B. Reed: Bull-reducible Berge graphs are perfect
- C. Fernández Cordoba, J. Rifà, J. Borges: Every  $Z2k$ -code is a binary propelinear code
- E. Gimadi: On the connectedness of service areas for network facility location problem
- E. Gimadi, N. Kairan: Multi-index axial assignment problem on single-cyclic permutations
- E. Godehardt, J. Jaworski: Two models of random intersection graphs and their applications

- P. Guitart: A faster shortest path heuristic for the Steiner problem in graphs  
H. Kheddouci: On the packing of trees into their power  
R. Martí, E. Nart: Isometry classes of codes arising from sets of points in the projective plane  
X. Molinero: Iterating through labelled combinatorial structures  
I. Pelayo, X. Marcote, C. Balbuena: Every cubic cage is quasi 4-connected  
S. Rukavina: On some new  $2-(56,12,3)$  designs  
O. Sans, A. Ponitz: Computation of the reconstruction probability of secret sharing schemes based on the  $k$ -terminal reliability  
A. Shastri: Time-relaxed multi-broadcasting in communication networks  
E. Simó: On dense triple-loop networks  
S. Strauss, L. Markenzon: A cryptographic code based on digraphs